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Sequence Listing was accepted.

See attached Validation Report.

If you need help call the Patent Electronic Business Center at (866)
217-9197 (toll free).

Reviewer: Keisha Douglas

Timestamp: Tue Aug 28 14:10:58 EDT 2007

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Application No: 10594766 Version No: 1.1

Input Set:

Output Set:

Started: 2007-08-28 14:09:57.965
Finished: 2007-08-28 14:09:58.919
Elapsed: 0 hr(s) 0 min(s) 0 sec(s) 954 ms
Total Warnings: 8
Total Errors: 0
No. of SeqIDs Defined: 32
Actual SeqID Count: 32

| Error code | Error Description |
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| W 213 | Artificial or Unknown found in <213> in SEQ ID (7) |
| W 213 | Artificial or Unknown found in <213> in SEQ ID (8) |
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| W 213 | Artificial or Unknown found in <213> in SEQ ID (11) |
| W 213 | Artificial or Unknown found in <213> in SEQ ID (12) |

SEQUENCE LISTING

<110> KAMINSKI, PIERRE-ALEXANDRE

<120> N-DEOXYRIBOSYL TRANSFERASES OF LACTOBACILLUS FERMENTUM
AND USE FOR THE ENZYMATIC SYNTHESIS OF
2',3'-DIDEOXYNUCLEOSIDES AND
2',3'-DIDEHYDRO-2',3'-DIDEOXYNUCLEOSIDES

<130> 296011US

<140> 10/594,766

<141> 2006-09-29

<150> PCT/FR05/000743

<151> 2005-03-29

<150> FR 0403319

<151> 2004-03-30

<160> 32

<170> PatentIn Ver. 3.3

<210> 1

<211> 504

<212> DNA

<213> Lactobacillus fermentum

<400> 1

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gaagaacaac gtgcccgcat ccctcaagct ctagcccaac tagaagcaa cccgactgtc 120
ggcgttgttc accagccatt cgattttcaa tataaagatg cacgcgtaga ctccgatacct 180
gccggcgtct ttggcagcct cgaatggcaa attgccactt acaataacga cctcaacgcg 240
gtaggaactt ccgatgtctg cgttgcttta tacgatatgg accaaattga cgaaggaatt 300
tgtatggaat tggcgtggtt cgtgcgcctc cataaaccta tcgttttact accttttact 360
aagaaagata agtctgctta tgaagctaac ctaatgctag cacggggtgt aactacctgg 420
ttggaaccta atgacttttag tcccttaaaa gactttaact ttaaccaccc aatggctcaa 480
cctttcccac cattcaaggt tttc 504
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<210> 2

<211> 168

<212> PRT

<213> Lactobacillus fermentum

<400> 2

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Ser Phe Phe Asn Glu Glu Gln Arg Ala Arg Ile Pro Gln Ala Leu Ala
      20             25             30

Gln Leu Glu Ala Asn Pro Thr Val Gly Val Val His Gln Pro Phe Asp
      35             40             45

Phe Gln Tyr Lys Asp Ala Arg Val Asp Ser Asp Pro Ala Gly Val Phe
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50 55 60
 Gly Ser Leu Glu Trp Gln Ile Ala Thr Tyr Asn Asn Asp Leu Asn Ala
 65 70 75 80
 Val Gly Thr Ser Asp Val Cys Val Ala Leu Tyr Asp Met Asp Gln Ile
 85 90 95
 Asp Glu Gly Ile Cys Met Glu Ile Gly Met Phe Val Ala Leu His Lys
 100 105 110
 Pro Ile Val Leu Leu Pro Phe Thr Lys Lys Asp Lys Ser Ala Tyr Glu
 115 120 125
 Ala Asn Leu Met Leu Ala Arg Gly Val Thr Thr Trp Leu Glu Pro Asn
 130 135 140
 Asp Phe Ser Pro Leu Lys Asp Phe Asn Phe Asn His Pro Met Ala Gln
 145 150 155 160
 Pro Phe Pro Pro Phe Lys Val Phe
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 <212> DNA
 <213> Lactobacillus fermentum

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 gaagaacaac gtgcccgcat ccctcaagct ctagcccaac tagaagccaa cccgactgtc 120
 ggcgttggtc accagccatt cgattttcaa tataaagatg caccgctaga ctccgatacct 180
 gccggcgtct ttggcagcct cgaatggcaa attgccactt acaataacga cctcaacgcg 240
 gtaggaactt ccgatgtctg cgttgcttta tacgatatgg accaaattga cgaaggaatt 300
 tgtatggaat tggcagtggt cgtcgccctc cataaaccta tcgttttact accttttact 360
 aagaaagata agtctgctta tgaagctaac ctaatgctag caccgggtgt aactacctgg 420
 ttggaacctt atgacttttag tcccttaaaa gactttaact ttaaccaccc aatggctcaa 480
 cctttccac cattcaaggt tttc 504

<210> 4
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 <212> PRT
 <213> Lactobacillus fermentum

<400> 4
 Met Lys Asn Thr Asp Pro Val Ala Asn Thr Lys Ile Tyr Leu Thr Thr
 1 5 10 15
 Ser Phe Phe Asn Glu Glu Gln Arg Ala Arg Ile Pro Gln Ala Leu Ala
 20 25 30
 Gln Leu Glu Ala Asn Pro Thr Val Gly Val Val His Gln Pro Phe Asp
 35 40 45
 Phe Gln Tyr Lys Asp Ala Arg Val Asp Ser Asp Pro Ala Gly Val Phe

50

55

60

Gly Ser Leu Glu Trp Gln Ile Ala Thr Tyr Asn Asn Asp Leu Asn Ala
 65 70 75 80

Val Gly Thr Ser Asp Val Cys Val Ala Leu Tyr Asp Met Asp Gln Ile
 85 90 95

Asp Glu Gly Ile Cys Met Glu Ile Gly Met Phe Val Ala Leu His Lys
 100 105 110

Pro Ile Val Leu Leu Pro Phe Thr Lys Lys Asp Lys Ser Ala Tyr Glu
 115 120 125

Ala Asn Leu Met Leu Ala Arg Gly Val Thr Thr Trp Leu Glu Pro Asn
 130 135 140

Asp Phe Ser Pro Leu Lys Asp Phe Asn Phe Asn His Pro Met Ala Gln
 145 150 155 160

Pro Phe Pro Pro Phe Lys Val Phe
 165

<210> 5

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 5

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39

<210> 6

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 6

tgtttcctgt gtgaaattgt tatccgctca c

31

<210> 7

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

oligonucleotide

<400> 7

gatatacata tgaaaaatac cgacccagtt gc

32

<210> 8

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<220>

<221> modified_base

<222> (1)..(2)

<223> a, t, c, g, unknown or other

<400> 8

nnggatacctt aggttagtta gaaaaccttg aatggtggg

39

<210> 9

<211> 22

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
primer

<400> 9

ttaatacgcac tcactatagg gg

22

<210> 10

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 10

gctagttatt gctcagcgg

19

<210> 11

<211> 33

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic

oligonucleotide

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<212> DNA

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<223> Description of Artificial Sequence: Synthetic
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<223> a, t, c, g, unknown or other

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nnggatacctt aggttagtta gaaaaccttg aatgggtggg

39

<210> 13

<211> 33

<212> PRT

<213> Lactobacillus acidophilus

<400> 13

Met Met Ala Lys Thr Lys Thr Leu Tyr Phe Gly Ala Gly Trp Phe Asn
1 5 10 15

Glu Lys Gln Asn Lys Ala Tyr Lys Ala Ala Met Glu Ala Leu Lys Gln
20 25 30

Asn

<210> 14

<211> 32

<212> PRT

<213> Lactobacillus helveticus

<400> 14

Met Asn Lys Lys Lys Thr Leu Tyr Phe Gly Ala Gly Trp Phe Asn Glu
1 5 10 15

Lys Gln Asn Lys Ala Tyr Lys Glu Ala Met Ala Ala Leu Lys Glu Asn
20 25 30

<210> 15

<211> 31

<212> PRT

<213> *Lactobacillus leichmannii*

<400> 15

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Pro | Lys | Lys | Thr | Ile | Tyr | Phe | Gly | Ala | Gly | Trp | Phe | Thr | Asp | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Asn | Lys | Ala | Tyr | Lys | Glu | Ala | Met | Glu | Ala | Leu | Lys | Glu | Asn |
| | | 20 | | | | | | 25 | | | | | 30 | |

<210> 16

<211> 31

<212> PRT

<213> *Lactobacillus leichmannii*

<400> 16

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Pro | Lys | Lys | Thr | Ile | Tyr | Phe | Ser | Ala | Gly | Trp | Phe | Thr | Asp | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Asn | Lys | Ala | Tyr | Lys | Glu | Ala | Met | Glu | Ala | Leu | Lys | Glu | Asn |
| | | 20 | | | | | | 25 | | | | | 30 | |

<210> 17

<211> 35

<212> PRT

<213> *Lactobacillus helveticus*

<400> 17

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Ala | Val | Val | Pro | Thr | Gly | Lys | Ile | Tyr | Leu | Gly | Ser | Pro | Phe |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Ser | Asp | Ala | Gln | Arg | Glu | Arg | Ala | Ala | Lys | Ala | Lys | Glu | Leu | Leu |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | |
|-----|-----|-----|
| Ala | Lys | Asn |
| | | 35 |

<210> 18

<211> 22

<212> PRT

<213> *Lactobacillus gasseri*

<400> 18

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | Lys | Gln | Lys | Thr | Val | Tyr | Phe | Gly | Ala | Gly | Trp | Phe | Thr | Glu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| Thr | Gln | Asn | Lys | Ala | Tyr |
| | | | | | 20 |

<210> 19

<211> 37

<212> PRT

<213> *Lactobacillus fermentum*

<400> 19

Leu Lys Asn Thr Asp Pro Val Ala Asn Thr Lys Ile Tyr Leu Ala Thr
1 5 10 15

Ser Phe Phe Asn Glu Glu Gln Arg Ala Arg Ile Pro Gln Ala Leu Ala
20 25 30

Gln Leu Glu Ala Asn
35

<210> 20

<211> 37

<212> PRT

<213> *Lactobacillus fermentum*

<400> 20

Leu Lys Asn Thr Asp Pro Val Ala Asn Thr Lys Ile Tyr Leu Thr Thr
1 5 10 15

Ser Phe Phe Asn Glu Glu Gln Arg Ala Arg Ile Pro Gln Ala Leu Ala
20 25 30

Gln Leu Glu Ala Asn
35

<210> 21

<211> 32

<212> PRT

<213> *Oenococcus oeni*

<400> 21

Met Asn Met Ala Lys Asn Ile Tyr Leu Ala Ser Pro Phe Phe Asp Asp
1 5 10 15

Glu Gln Ile Ala Arg Val Lys Lys Ile Glu Lys Ala Leu Glu Ser Asn
20 25 30

<210> 22

<211> 28

<212> PRT

<213> *Leuconostoc mesenteroides*

<400> 22

Lys Asn Val Tyr Leu Ala Ser Pro Phe Phe Asp Lys Glu Gln Ile Glu

| | | | |
|---|---|----|----|
| 1 | 5 | 10 | 15 |
|---|---|----|----|

Arg Val Glu Arg Val Glu Lys Ala Leu Ala Ala Asn
20 25

<210> 23
<211> 26
<212> PRT
<213> *Lactobacillus plantarum*

<400> 23
Val Tyr Leu Ala Ala Pro Phe Phe Asp Glu Ala Gln Lys Glu Arg Ile
1 5 10 15

Gln Gln Val Lys Ser Ala Leu Leu Ala Asn
20 25

<210> 24
<211> 20
<212> PRT
<213> *Lactobacillus lactis*

<400> 24
Asn Gln Ala Val Asn Val Tyr Leu Ala Ala Pro Phe Phe Ser Glu Ser
1 5 10 15

Gln Ile Lys Lys
20

<210> 25
<211> 158
<212> PRT
<213> *Lactobacillus helveticus*

<400> 25
Met Asn Lys Lys Lys Thr Leu Tyr Phe Gly Ala Gly Trp Phe Asn Glu
1 5 10 15

Lys Gln Asn Lys Ala Tyr Lys Glu Ala Met Ala Ala Leu Lys Glu Asn
20 25 30

Pro Thr Val Asp Leu Glu Asn Ser Tyr Val Pro Leu Glu Asn Gln Tyr
35 40 45

Lys Gly Ile Arg Ile Asp Glu His Pro Glu Tyr Leu His Asn Ile Glu
50 55 60

Trp Ala Ser Ala Thr Tyr His Asn Asp Leu Val Gly Ile Lys Thr Ser
65 70 75 80

Asp Val Met Leu Gly Val Tyr Leu Pro Glu Glu Glu Asp Val Gly Leu
85 90 95

Gly Met Glu Leu Gly Tyr Ala Leu Ser Gln Gly Lys Tyr Ile Leu Leu

| | | |
|---|-----|-----|
| 100 | 105 | 110 |
| Val Ile Pro Asp Glu Asp Tyr Gly Lys Pro Ile Asn Leu Met Ser Trp | | |
| 115 | 120 | 125 |
| Gly Val Cys Asp Asn Ala Ile Lys Ile Ser Glu Leu Lys Asp Phe Asp | | |
| 130 | 135 | 140 |
| Phe Asn Lys Pro Arg Tyr Asn Phe Tyr Asp Gly Ala Val Tyr | | |
| 145 | 150 | 155 |

<210> 26
 <211> 159
 <212> PRT
 <213> Lactobacillus acidophilus

| |
|---|
| <400> 26 |
| Met Met Ala Lys Thr Lys Thr Leu Tyr Phe Gly Ala Gly Trp Phe Asn |
| 1 5 10 15 |
| Glu Lys Gln Asn Lys Ala Tyr Lys Ala Ala Met Glu Ala Leu Lys Gln |
| 20 25 30 |
| Asn Pro Thr Val Asp Leu Glu Asn Ser Tyr Val Pro Leu Glu Asn Gln |
| 35 40 45 |
| Tyr Lys Asp Ile Arg Val Asp Glu His Pro Glu Tyr Leu His Asp Ile |
| 50 55 60 |
| Glu Trp Ala Ser Ala Thr Tyr His Asn Asp Leu Ile Gly Ile Lys Ser |
| 65 70 75 80 |
| Ser Asp Ile Met Leu Gly Val Tyr Leu Pro Glu Glu Glu Asp Val Gly |
| 85 90 95 |
| Leu Gly Met Glu Leu Gly Tyr Ala Leu Ser Gln Gly Lys Tyr Ile Leu |
| 100 105 110 |
| Leu Val Ile Pro Asp Glu Asp Tyr Gly Lys Pro Ile Asn Leu Met Ser |
| 115 120 125 |
| Trp Gly Val Cys Asp Asn Ala Ile Lys Ile Ser Glu Leu Lys Asp Phe |
| 130 135 140 |
| Asp Phe Asn Lys Pro Arg Phe Asn Phe Tyr Asp Gly Ala Val Tyr |
| 145 150 155 |

<210> 27
 <211> 149
 <212> PRT
 <213> Lactobacillus johnsonii

| |
|---|
| <400> 27 |
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| 1 5 10 15 |

Met Ser Ala Leu Asn Ala Asn Pro Thr Ile Asp Leu Glu Asn Ser Tyr
 20 25 30

Val Pro Leu Gln Asn Gln Tyr Lys Asp Ile Arg Val Asp Glu His Pro
 35 40 45

Glu Tyr Leu His Asp Lys Glu Trp Ala Gln Ala Thr Tyr Asn Gly Asp
 50 55 60

Leu Val Gly Ile Lys Thr Ser Asp Val Met Leu Gly Val Tyr Val Pro
 65 70 75 80

Lys Glu Glu Asp Val Gly Leu Gly Met Glu Leu Gly Tyr Ala Met Ser
 85 90 95

Gln Gly Lys Tyr Val Leu Leu Val Ile Pro Asp Glu Leu Tyr Gly Glu
 100 105 110

Ser Ile Asn Leu Met Ser Trp Gly Val Ala Asp Asn Val Ile Lys Met
 115 120 125

Ser Glu Leu Ala Thr Phe Asp Phe Asn Arg Pro Arg Tyr Asn Phe Tyr
 130 135 140

Asp Gly Ala Val Tyr
 145

<210> 28
 <211> 157
 <212> PRT
 <213> Lactobacillus leichmannii

<400> 28

Met Pro Lys Lys Thr Ile Tyr Phe Gly Ala Gly Trp Phe Thr Asp Arg
 1 5 10 15

Gln Asn Lys Ala Tyr Lys Glu Ala Met Glu Ala Leu Lys Glu Asn Pro
 20 25 30

Thr Ile Asp Leu Glu Asn Ser Tyr Val Pro Leu Asp Asn Gln Tyr Lys
 35 40 45

Gly Ile Arg Val Asp Glu His Pro Glu Tyr Leu His Asp Lys Val Trp
 50 55 60

Ala Thr Ala Thr Tyr Asn Asn Asp Leu Asn Gly Ile Lys Thr Asn Asp
 65 70 75 80

Ile Met Leu Gly Val Tyr Ile Pro Asp Glu Glu Asp Val Gly Leu Gly
 85 90 95

Met Glu Leu Gly Tyr Ala Leu Ser Gln Gly Lys Tyr Val Leu Leu Val
 100 105 110

Ile Pro Asp Glu Asp Tyr Gly Lys Pro Ile Asn Leu Met Ser Trp Gly

115

120

125

Val Ser Asp Asn Val Ile Lys Met Ser Gln Leu Lys Asp Phe Asn Phe
130 135 140

Asn Lys Pro Arg Phe Asp Phe Tyr Glu Gly Ala Val Tyr
145 150 155

<210> 29

<211> 168

<212> PRT

<213> Lactobacillus fermentum

<400> 29

Leu Lys Asn Thr Asp Pro Val Ala Asn Thr Lys Ile Tyr Leu Ala Thr
1 5 10 15

Ser Phe Phe Asn Glu Glu Gln Arg Ala Arg Ile Pro Gln Ala Leu Ala
20 25 30

Gln Leu Glu Ala Asn Pro Thr Val Gly Val Val His Gln Pro Phe Asp
35 40 45

Phe Gln Tyr Lys Asp Ala Arg Val Asp Ser Asp Pro Ala Gly Val Phe
50 55 60

Gly Ser Leu Glu Trp Gln Ile Ala Thr Tyr Asn Asn Asp Leu Asn Ala
65 70 75